REMARKS

Disposition of Claims

Upon entry of this Amendment, claims 9-16 and 18-19 (as amended) will remain pending in the application and stand ready for further action on the merits. The amendments to the claims are fully supported by the specification and drawings. No new matter has been added to the specification.

Claims 17 and 20 have been canceled without prejudice or disclaimer of the subject matter contained therein.

Claims 1-8 have been withdrawn from consideration as being drawn to a non-elected invention based on a restriction requirement of the Examiner.

Drawings

The Office Action states that new drawings are required, because the drawings on file have very poor image contrast. In response, Applicants are submitting corrected, formal drawings (Figures 1-10) which are attached hereto. It is believed that the attached drawings are in condition for acceptance by the Examiner.

Restriction Requirement

Applicants affirm the election of Group II (claims 9-20). Claims 1-8 have been withdrawn from consideration as being drawn to a non-elected invention

Specification

Per the Examiner's request, Applicants have corrected certain typographical errors in the specification (page 2, lines 28-31) by amending the specification. The amendment to the specification is set forth above.

Claim Objections

The Office Action states that claim 1 is objected to because of certain typographical errors. Claim 1 now has been withdrawn from consideration as being drawn to a non-elected

invention; thus, claim 1 has not been amended herein. Nevertheless, if the Examiner still wishes that Applicants amend claim 1 to correct these typographical errors, Applicants will do so in a future paper.

Claim Rejections Under 35 U.S.C. §112

The Office Action rejects claims 14-20 under 35 U.S.C. §112, second paragraph as being indefinite. In particular, the Office Action objects to the term, "said conventional ferrule" in claim 14, because there is no antecedent basis for this term. Claim 14 now has been amended to substitute the term, - - - an optical ferrule - - - in place of "said conventional ferrule." In view of the foregoing, it is respectfully requested that the rejection of claims 14-20 under 35 U.S.C. §112 be withdrawn.

Rejection of Claims 9-13 Under 35 U.S.C. §102

The Office Action states that claims 9-13 are rejected under 35 U.S.C.§102(e) as being anticipated by Zhou, U.S. Patent 6,081,638 ("Zhou"). It is submitted that Zhou does not anticipate the present invention, as recited in amended claims 9-13, for the reasons discussed below.

Applicants agree with the Examiner that Zhou discloses an optical header for coupling a light source to an optical fiber. As the Examiner points out, Zhou shows in FIG. 4 an optical header (40) with a light source (102) that can be a VCSEL, and a photodetector (103). The internal region (110) of the header block (100) can be filled with a clear resin or air. In FIG. 4, the light source (102) and photodetector (103) are each mounted on the same planar surface of the header block (100) and are arranged in such a way that the photodetector (103) is above the light source (102). The light source (102) is mounted underneath the photodetector (103) so that light radiates upwardly:

> End 101A of fiber 101 is preferably cleaved or polished at an angle, and light from a light source 102 (which is preferably a VCSEL, edge emitting laser, or other type of laser) radiates upward through fiber 101 where the light is partially reflected and partially transmitted into fiber 101 by a reflective coating 105 on the outer surface of the fiber end 101A. (col. 6, lines 38-44).

It is recognized that Zhou defines the terms, "above" and "below" as referring to the relative positions of the elements in the drawings and that the header arrangement can be rotated or turned in many ways according to Zhou (col. 4, lines 4-11). Nevertheless, the light source (102) and the photodetector (103) would be mounted on the same planar surface of the header block (100) even if the optical header (40) in FIG. 4 was rotated.

In contrast to Zhou, Applicants' substrate assembly comprises a semiconductor substrate having an optoelectronic light-emitting device disposed on a surface thereof and a ceramic mounting substrate having a photodetector disposed on a surface thereof. Thus, there are two separate and distinct substrate surfaces in Applicants' assembly versus the single optical header block (100) shown in FIG. 4 of Zhou.

More particularly, in Applicants' assembly, the light-emitting device may be a VCSEL die (3) containing a linear array of VCSELs. The VCSEL die (3) is mechanically coupled to the semiconductor substrate (10) by use of a die-attach epoxy, and the semiconductor substrate (10) is mechanically coupled to the ceramic mounting substrate (7). As shown in FIG. 1, the ceramic mounting substrate (7) is configured so that a portion of the semiconductor substrate (10) overhangs the mounting substrate (7). (See page 7, lines 12-31 to page 8, lines 1-14.) This structure is important, because it enables the photodetector (6) to be placed beneath the overhanging portion of semiconductor substrate (10) and VCSEL die (3) so that it can receive light transmitted through the transparent semiconductor substrate (10) and die (3). (page 8, line 31 to page 9, lines 1-3).

Turning to FIG. 3 in Zhou, this drawing shows the photodetector (103) mounted on the upper surface of a glass prism (104), and the light-source (102) is mounted on the base substrate (100A) so that the photodetector hangs over the light source. In another embodiment, a glass plate (111) is used in place of the prism (FIG. 5). However, neither the glass prism (104) nor glass plate (111) is attached to the Zhou base substrate (100A) in a manner as recited in amended claims 9-13 and as shown in FIG. 1 of the present application.

It is submitted that Zhou does not anticipate the present invention, because Zhou does not disclose an assembly having the structure as recited in amended claims 9-13. Zhou does not disclose each element of the presently claimed invention as required by an anticipatory

reference. Accordingly, it is respectfully requested that the rejections of claims 9-13 (as amended) under 35 U.S.C. §102(e) be withdrawn.

Secondly, the Office Action states that claims 14-15 and 20 are rejected under 35 U.S.C.§102(e) as being anticipated by Jewell et al., U.S. Patent 6,243,508 ("Jewell"). It is submitted that Jewell does not anticipate the present invention, as recited in amended claims 14-15 and 20 for the reasons discussed below.

Applicants agree with the Examiner that Jewell discloses an optical subassembly comprising an optoelectronic transducer that is mechanically attached to an optical wafer substrate that can be made of a ceramic or semiconductor material. The transducer may be attached using epoxy or solder with a heating step. A photodiode may be aligned with the transducer and fixed to the optical wafer using the same mounting process as used for the transducer (col. 9, lines 55-67 and col. 12, lines 57-63). As the Examiner points out, Figure 16 in Jewell shows a base unit (81) having a pair of guide pins (84) that joins the optical ferrule (82) to the base unit (81). Optical wafers (12) and (14) are disposed between the base unit (81) and optical ferrule (82). Thus, in the optical subassembly of Jewell, as shown in Figure 16, the transducer (26, 26') and the photodiode (40) are mounted on the same bottom planar surface of the optical wafer (12).

In contrast, Applicants' substrate assembly comprises a U-shaped weld plate having a VCSEL array disposed on a surface thereof and a ceramic substrate having a photodetector disposed on a surface thereof. Thus, there are two separate and distinct substrate surfaces in Applicants' assembly versus the single optical wafer surface (12) shown in Figure 16 of Jewell.

More particularly, as shown in FIGS. 6 and 7 and as described at page 15, lines 7-19 of Applicants' specification, the U-shaped weld plate (106) has a notched portion (128) that permits light from the VCSEL array (3) to pass through and be detected by the photodiode (6) which is aligned below the notch and mounted on the ceramic substrate (104). The weld plate (106) and ceramic substrate (104) are mechanically bonded to each other as described at page 16, lines 10-21.

It is submitted that Jewell does not anticipate the present invention, as recited in amended claims 14-15 and 20, because no embodiment of the optical subassembly in Jewell

includes the claimed structure. Jewell does not disclose each element of the presently claimed invention as required by an anticipatory reference. In view of the foregoing, it is respectfully requested that the rejections of claims 14-15 and 20 (as amended) under 35 U.S.C. §102(e) be withdrawn.

Claim Rejections Under 35 U.S.C. §103(a)

The Office Action states that claim 16 is rejected under 35 U.S.C.§103(a) as being unpatentable over Jewell as applied to claim 14 in view of Henson et al., U.S. Patent 5,940,562 ("Henson"). It is submitted that the present invention, as recited in claim 16, is not prima facie obvious over Jewell and Henson.

Claim 14 has been amended and Applicants believe that claim 14 is now in condition for allowance for the reasons discussed above. Claim 16 depends from amended claim 14. Thus, it is submitted that claim 16 is in condition for allowance.

Addressing the Henson reference, Applicants agree with the Examiner that Henson discloses an optoelectronic device receptacle comprising a receptacle alignment block with an optoelectronic component, such as an array of VCSELs, mounted to the surface thereof. The alignment block can engage a fiber optic connector. FIG. 8 in Henson shows a latching mechanism for latching the connector to the receptacle. However, Henson does not disclose or suggest a substrate assembly having two distinctive substrate surfaces, a U-shaped weld plate and ceramic substrate, as recited in amended claim 14.

In view of the foregoing, it is requested that the rejection of claim 16 under 35 U.S.C.§103(a) be withdrawn.

The Office Action states that claim 17 is rejected under 35 U.S.C.§103(a) as being unpatentable over Jewell. Claims 17 and 20 have been canceled, and the limitations of claims 17 and 20 have been incorporated into claim 14 as discussed above.

Objections to Claims 18-19

The Office Action states that claims 18 and 19 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form to

overcome the above-discussed rejections under 35 U.S.C. §112 and that they include all of the limitations of the base claim and any intervening claim.

Applicant believes that amended claim 14 is now in condition for allowance for the reasons discussed above. Claims 18 and 19 depend directly on amended claim 14. Dependent claim 18 has been amended to recite an optical ferrule as stated in amended base claim 14. Thus, it is respectfully submitted that claims 18 and 19 are in condition for allowance.

Conclusion

In summary, Applicants submit that all of the claims presented for consideration herein are patentable and each of the Examiner's rejections and objections has been overcome. Accordingly, Applicants respectfully request favorable consideration and allowance of the claims (as amended).

The Commissioner is hereby authorized to charge any additional fees required in connection with the filing of this paper or credit any overpayment to Deposit Account 02-0900.

Should there be any outstanding matter that needs to be resolved in the present application, the Examiner is invited to contact the undersigned at the telephone number listed below.

Respectfully submitted,

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Attachments: Formal Drawings 1-10 (Sheets 1-15)